

What is claimed is:

1. A method of dependency management in a component-based system comprising:  
defining a resource;  
recording an identifier for the resource;  
recording resource dependency relationships definitions for the resource;  
deploying the resource and the resource dependency relationships of the resource to a system including  
verifying the existence of all dependency relationship resources of the resource on the system,  
transmitting a warning if any of the dependencies of the are unsatisfied,  
creating an abstract resource based on a dependency relationship definition of the abstract resource if the abstract resource is not found on the system, and  
ending deployment if any dependency relationship is unsatisfied and deployment can not be completed without dependency.
2. The method of claim 1 wherein defining a resource comprises storing a definition of a resource in a tool to be accessed by a service creation environment ("SCE"), a deployment tool and a service logic execution environment ("SLEE").
3. The method of claim 1 wherein recording an identifier to a resource comprises recording an identifier including resource identification, type identification and version.
4. The method of claim 3 wherein recording an identifier further comprises recording an identifier including scope of the resource.
5. The method of claim 1 wherein recording dependency information comprises recording associations between the resource identifier and resource identifiers for the dependency relationship resources.
6. The method of claim 1 wherein recording dependency information comprises automatically recording dependency information.
7. The method of claim 1 wherein recording dependency information comprises manually recording dependency information through one of: software coding and configuration.

8. The method of claim 1 wherein recording resource dependency definitions comprises defining dependencies for the resource.
9. The method of claim 1 wherein recording resource dependency definitions comprises identifying type of dependency for each dependency resource.
10. The method of claim 9 wherein identifying the type of dependency comprises identifying the dependency as one of a resource that is contained by an entity and a resource that is used by the entity, wherein a resource that is contained by the entity is also used by the entity.
11. The method of claim 10 wherein if a resource can be deployed without satisfying a dependency relationship if the dependency resource is a uses type dependency.
12. The method of claim 10 wherein identifying the dependency type comprises identifying the dependency type according to the rules:
  - if entity A uses resource B and resource B uses resource C, then A contains C,
  - if A contains B and B contains C, then A contains C,
  - if A uses B and B contains C, then A uses C, and
  - if A contains B and B uses C, then A uses C.
13. The method of claim 1 wherein deploying the resource comprises using a deployment tool to deploy the resource wherein the deployment tool transmits information regarding dependency relationships to a resource management infrastructure.
14. The method of claim 1 wherein recording resource dependency relationships definitions for the resource comprises recording dependency relationships to at least one resource pool, the resource pool including a set of homogenous resources used interchangeably on a dynamic basis and allocated to dependent objects as needed.
15. The method of claim 1 further comprising creating a relationship between the resource and a resource pool manager if the resource will be used interchangeably with other resources in a resource pool, wherein the resource pool manager acts as a proxy for the pooled resources and handles dependency relationships on behalf of the pooled resources.
16. A system for dependency management in a component-based system comprising:
  - means for defining a resource;

means for recording an identifier for the resource;

means for recording resource dependency relationships definitions for the resource;

means for deploying the resource and the resource dependency relationships of the resource to a system including

means for verifying the existence of all dependency relationship resources of the resource on the system,

means for transmitting a warning if any of the dependencies of the are unsatisfied,

means for creating an abstract resource based on a dependency relationship definition of the abstract resource if the abstract resource is not found on the system,

and

means for ending deployment if any dependency relationship is unsatisfied and deployment can not be completed without dependency.

17. The system of claim 16 wherein the means for defining a resource comprises means for storing a definition of a resource in a tool to be accessed by a service creation environment (“SCE”), a deployment tool and a service logic execution environment (“SLEE”).

18. The system of claim 16 wherein the means for recording an identifier to a resource comprises means for recording an identifier including resource identification, type identification and version.

19. The system of claim 18 wherein the means for recording an identifier further comprises means for recording an identifier including scope of the resource.

20. The system of claim 16 wherein the means for recording dependency information comprises means for recording associations between the resource identifier and resource identifiers for the dependency relationship resources.

21. The system of claim 16 wherein the means for recording dependency information comprises means for automatically recording dependency information.

22. The system of claim 16 wherein the means for recording dependency information comprises means for manually recording dependency information through one of: software coding and configuration.

23. The system of claim 16 wherein the means for recording resource dependency definitions comprises means for defining dependencies for the resource.
24. The system of claim 16 wherein the means for recording resource dependency definitions comprises means for identifying type of dependency for each dependency resource.
25. The system of claim 24 wherein the means for identifying the type of dependency comprises means for identifying the dependency as one of a resource that is contained by an entity and a resource that is used by the entity, wherein a resource that is contained by the entity is also used by the entity.
26. The system of claim 25 wherein a resource can be deployed without satisfying a dependency relationship if the dependency resource is a uses type dependency.
27. The system of claim 25 wherein the means for identifying the dependency type comprises means for identifying the dependency type according to the rules:
- if entity A uses resource B and resource B uses resource C, then A contains C,
  - if A contains B and B contains C, then A contains C,
  - if A uses B and B contains C, then A uses C, and
  - if A contains B and B uses C, then A uses C.
28. The system of claim 16 wherein the means for deploying the resource comprises means for using a deployment tool to deploy the resource wherein the deployment tool transmits information regarding dependency relationships to a resource management infrastructure.
29. The system of claim 16 wherein the means for recording resource dependency relationships definitions for the resource comprises means for recording dependency relationships to at least one resource pool, the resource pool including a set of homogenous resources used interchangeably on a dynamic basis and allocated to dependent objects as needed.
30. The system of claim 16 further comprising means for creating a relationship between the resource and a resource pool manager if the resource will be used interchangeably with

other resources in a resource pool, wherein the resource pool manager acts as a proxy for the pooled resources and handles dependency relationships on behalf of the pooled resources.

31. A method of managing dependencies in a component-based system comprising:  
performing at least one of a startup and an initialization of a resource up to inter-component connection;

determining if the resource has any dependency resources, the resource and its dependency resources forming a group of resources;

waiting for dependency resources to complete initialization;

establishing connections to dependency resources;

proceeding with the at least one of startup and initialization; and

establishing connections to the resource from the dependency resources.

32. The method of claim 31 further comprising:

receiving indication from the resource that its internal resources have been successfully allocated and that the resource is waiting for connection;

requesting connection information from an inter-component connection manager; and

receiving inter-component connection information from the inter-component connection manager.

33. The method of claim 31 wherein determining if the resource has any dependency resource comprises determining dependency inter-component connection information from inter-component connection information received from an inter-component connection manager.

34. The method of claim 31 wherein inter-component connection the resources comprises placing the resource on a ready for inter-component connection list until the dependency resources have been started;

receiving indication from the dependency resource that its internal resources have been successfully allocated and that the dependency resource is waiting for inter-component connection;

requesting inter-component connection information from a inter-component connection manager; and

traversing all entries of inter-component connection information.

35. The method of claim 31 wherein performing startup of the dependency resources comprises requesting a resource pool manager to assign a dependency resource from the resource pool.

36. A system for managing dependencies in a component-based system comprising:  
means for performing at least one of a startup and an initialization of a resource up to inter-component connection;

means for determining if the resource has any dependency resources, the resource and its dependency resources forming a group of resources;

means for waiting for dependency resources to complete initialization;

means for establishing connections to dependency resources;

means for proceeding with the at least one of startup and initialization; and

means for establishing connections to the resource from the dependency resources.

37. The system of claim 36 further comprising:

means for receiving indication from the resource that its internal resources have been successfully allocated and that the resource is waiting for inter-component connections;

means for requesting inter-component connection information from a inter-component connection manager; and

means for receiving inter-component connection information from the inter-component connection manager.

38. The system of claim 36 wherein the means for determining if the resource has any dependency resource comprises means for determining dependency inter-component connection information from inter-component connection information received from an inter-component connection manager.

39. The system of claim 36 wherein the means for performing inter-component connection on the resources comprises

means for placing the resource on a ready for inter-component connection list until the dependency resources have been started;

means for receiving indication from the dependency resource that its internal resources have been successfully allocated and that the dependency resource is waiting for inter-component connections;

means for requesting inter-component connection information from a inter-component connection manager; and

means for traversing all entries of inter-component connection information.

40. The system of claim 36 wherein the means for performing startup of the dependency resources comprises means for requesting a resource pool manager to assign a dependency resource from the resource pool.

41. A method of managing dependencies in a component-based system comprising:  
receiving indication of a state change for a first resource;  
transmitting the indication of the state change of the first resource to a second resource dependent on the first resource;  
receiving indication of a state change of the second resource.

42. The method of claim 41 wherein receiving indication of the state change of the first resource comprises receiving indication of the state change from a managed object view of the first resource, transmitting the indication of state change to the second resource comprises transmitting the indication to a managed object view of the second resource and receiving indication of the state change of the second resource comprises receiving the indication of state change from the managed object view of the second resource.

43. A system for managing dependencies in a component-based system comprising:  
means for receiving indication of a state change for a first resource;  
means for transmitting the indication of the state change of the first resource to a second resource dependent on the first resource;  
means for receiving indication of a state change of the second resource.

44. The system of claim 43 wherein the means for receiving indication of the state change of the first resource comprises means for receiving indication of the state change from a

managed object view of the first resource, the means for transmitting the indication of state change to the second resource comprises means for transmitting the indication to a managed object view of the second resource and the means for receiving indication of the state change of the second resource comprises means for receiving the indication of state change from the managed object view of the second resource.

45. A computer readable medium, the computer readable medium storing computer readable code executable to perform a method for managing a component-based system comprising:

defining a resource;

recording an identifier for the resource;

recording resource dependency relationships definitions for the resource;

deploying the resource and the resource dependency relationships of the resource to a system including

verifying the existence of all dependency relationship resources of the resource on the system,

transmitting a warning if any of the dependencies of the are unsatisfied, creating an abstract resource based on a dependency relationship definition of the abstract resource if the abstract resource is not found on the system, and

ending deployment if any dependency relationship is unsatisfied and deployment can not be completed without dependency.

46. A computer readable medium, the computer readable medium storing computer readable code executable to perform a method for managing a component-based system comprising:

performing at least one of a startup and an initialization of a resource up to inter-component connection;

determining if the resource has any dependency resources, the resource and its dependency resources forming a group of resources;

waiting for dependency resources to complete initialization;

establishing connections to dependency resources;



proceeding with the at least one of startup and initialization; and  
establishing connections to the resource from the dependency resources.

47. A computer readable medium, the computer readable medium storing computer readable code executable to perform a method for managing a component-based system comprising:

receiving indication of a state change for a first resource;

transmitting the indication of the state change of the first resource to a second resource dependent on the first resource;

receiving indication of a state change of the second resource.